It's like ordering a car from the factory – Building Cx means quality work

By Mike Purcell, Energy Specialist

How many people would buy a car without reading reviews, talking to other car owners, or test-driving the car? For the vehicles you drive regularly, can you tell when they are working well?

Many people, even if they can't solve the problems themselves, at least realize when something is wrong. But few people know what good performance or value is in a building. Even fewer know how to get it.

In the last 50 years, Americans have gone from spending nearly half their time indoors to spending nearly 90 percent in buildings. As a result, the quality of the buildings has become much more important. The health (or lack) a building fosters in its users has implications in labor costs, legal risk, and overall morale.

Consequently, the systems in buildings have become more integrated and complicated. Typically they do not receive the attention they deserve because the design and construction process has not changed to address the increased complexity. Building systems include heating, venting and air conditioning; fire and security alarms, lighting, water heating and cooling towers.

As a result, even brand new buildings frequently end up costing the owners more than necessary in productivity losses, energy costs, maintenance, and even liability.

System features

Go back to the car analogy. If you bought a new car, say a Honda Accord or Ford Taurus, and the mileage was 30 percent lower than the sticker on the window said, would you do nothing? What if the air conditioner was blowing on the passenger side, but the air was hot on the driver's side? What if you specified a 10-CD changer, but received a one CD player?

Probably most of you would be back knocking on the dealer's door right away. Yet when it comes to buildings, we frequently have no idea what the mileage should be or how to tell the difference between a one- and a 10-disc CD player.

For these reasons, the use of the building commissioning process, commonly referred to as Cx, has increased around the country. New building Cx is the process of ensuring that building systems are designed, installed, tested, and capable of being operated and maintained according to the owner's operational needs.

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Building systems, especially in larger commercial buildings, are difficult to understand, and rightly so. As systems offer more and more features, they tend to become more integrated with other systems. Just as we rely on lawyers and accountants to help us navigate tax law, we need to begin using Cx professionals, or Cx agents, to help us navigate the complicated processes of designing, building, and operating buildings properly.

Usage demands

Cx is not a new concept. It has been used for years in the military. The maiden voyage of a submarine is not the first time welds or engine performance have been checked, nor should it be. The first day of school in August isn't the time to find out the wrong air conditioning equipment was installed or the water heater in the kitchen isn't connected. Life safety systems are even more critical. They may have been installed beautifully, but not meet the usage demands.

At risk in new building construction is incompatible, nonworking, incorrectly installed, or under-performing equipment. Each of these issues can cause delays in building occupancy, increased construction and ownership costs, and headaches for building owners.

In the long term, poorly performing buildings can increase maintenance and operation costs, lower worker productivity, and increase comfort complaints and vacancy rates. More and more building owners are deciding that is too much to risk.

As Dave Logan of Ada County Operations likes to say, "On time and on budget aren't good enough if buildings aren't working properly. Commissioning helps me win every time. I want to win every time."

A well-designed Cx process begins as early as the design stage. Architects, engineers, and contractors are in general much more accepting of the process when it does not appear to be merely a means of checking up on questionable work. Many realize Cx can help them achieve higher customer satisfaction, resulting in repeat business.

The Cx agent attempts to evaluate the integration and performance of potential systems beforehand to avoid incompatibilities and make sure the design intent of the building is met by the proposed plans. If a proposed system or design cannot meet the owner's expectations, the Cx agent works with the designers to come up with a revised plan.

Once the plans are approved and construction begins, the Cx agent monitors the construction site to ensure the specified systems are installed according to plan. If issues develop, the Cx agent discusses them with all parties, especially the owner. Emphasis is put on meeting the design criteria established earlier.

As construction progresses, systems are inspected and tested according to protocols established during the design phase, again, to ensure the equipment can perform according to design criteria. After the equipment is tested and operating correctly, building staff members are trained in their use and maintenance.

This step is where expertise and knowledge gets handed over to the owners so they can operate the building properly, keeping comfort and performance high and costs low.

Final result

One of the reasons building owners hesitate to use Cx is the perceived extra cost. Some say they should be getting well-designed and functioning buildings for what they are already paying. However, this doesn't happen enough of the time to rely on

By commissioning the new 350,000-square-foot Ada County Courthouse, Dave Logan, Ada County operations director, knows the building is as energy- and resource-efficient as possible. Although the new courthouse has twice the square footage as the previous building, the county saw a 56 percent reduction in cost per square foot during the first full month of operation compared to the previous year's cost. ***(Photo by Mike Purcell)***

it. In the brutal low bid construction environment, corners will be cut.

In addition, with the increased sophistication and integration of building systems, it can be difficult for contractors and designers to keep up with all of the changes in other disciplines that may affect theirs.

A Cx agent can help bridge that gap and prevent more costly changes after construction has begun. Some creative building owners, realizing that change orders are likely to decrease with more eyes in the design process, reduce the change order budget to pay for the Cx process.

Other building owners point to the reduced risk as the sole reason they have adopted Cx as standard practice. Robin Smith of Emory University says even though energy savings are achieved with optimally designed, installed, and tuned equipment in new buildings, the fact that the Cx process allows them to count on a fully functioning building upon occupancy is worth the cost alone. They have experienced fewer construction delays, cost overruns, and surprises in general.

More and more building owners are beginning to realize that buying cheap buildings typically results in higher lifetime costs. Spending a bit more time, effort, and even money, on the front end of a building project can save for years to come. The use of commissioning is one vital tool in fostering a "win-every-time" process in quality facility, and fiscal management.

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